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| REED SMITH, LLP ATTN: PATENT RECORDS DEPARTMENT 599 LEXINGTON AVENUE, 29TH FLOOR NEW YORK, NY 10022-7650 | | | PHAM, HAI CHI | |
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| | | | 2861 | |

DATE MAILED: 10/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/581,377

Applicant(s)

RETSCHKE ET AL.

Examiner

Hai C Pham

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2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38,66-102 and 104-110 is/are pending in the application.
- 4a) Of the above claim(s) 89-91 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 102 is/are allowed.
- 6) ☐ Claim(s) 1-7,66-80,83-88,92-101 and 104-110 is/are rejected.
- 7) ☒ Claim(s) 8-38,81 and 82 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7, 11-13.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Specification

1. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

Claim Objections

2. The following claims are objected to because of the following informalities:

Claim 30:

- Line 2, "the surface" should read --a surface--;
- Line 3, "a surface" should read --the surface--.

Claim 31:

- Line 2, "on the board" should read --on the surface--;

Claim 32:

- Line 2, "the surface" should read --a surface--;
- Line 10, "on the board" should read --on the surface--.

Claim 33:

- Line 2, "on-half" should read --one-half--.

Claim 66:

- Line 3, "a light beam" should read --said first beam--.

Claim 70:

- Line 3, "a light beam" should read --said first beam--.

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- Line 12, "characterized in that" should read --wherein--.

Claim 71:

- Line 4, "lineal" should read --linear--.

Claim 77:

- Line 3, "a light beam" should read --said first beam--.

Claim 83:

- Line 3, "said stable clock" should read --said timing clock--.

Claim 84:

- Line 3, "the modulated beams" should read --the modulated beam--.

Claim 93:

- Line 1, "Scanning optics" should read --Scanning apparatus--.

Claim 94:

- Line 1, "Scanning optics" should read --Scanning apparatus--.

Claim 95:

- Line 2, "lineal" should read --linear--.

Claim 106:

- Line 2, "lineal" should read --linear--.

Appropriate correction is required.

3. Claim **110**, which is dependent from claim 70, is objected to under 37

CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim, or amend the claim

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to place the claim in proper dependent form, or rewrite the claim in independent form.

Claim 110 recites the following limitation "wherein the second beam impinges the scale at an angle to its surface, such that the modulated reflected beam is reflected along an axis, different from that of the second beam", which is entirely included in the base claim 70.

Duplicate Claims

4. Claims 77, 107, and 108 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 70, 68, and 69, respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-7, 104 are rejected under 35 U.S.C. 102(b) as being anticipated by Scifres et al. (U.S. 4,445,125).

Scifres et al., an acknowledged prior art, discloses an optical scanning device and method for writing a pattern on a surface, the method comprising providing a scanning beam comprised of a plurality of independently addressable sub-beams (formed by the array of emitted light beams generated by the diode laser array), scanning the surface with said scanning beam a plurality of times (illuminating with the N laser light beams the same scan spots on the same scan line of the recording medium), said sub-beams scanning the surface side-by side in the cross-scan direction, each said sub-beam being modulated (intensity modulated) to reflect information to be written (col. 2, lines 40-45), and overlapping the beams such that all written areas of the surface are written on during at least two scans (two light beams 5a and 5b being disclosed to scan the same scan line in an overlapping manner to form a complete scan line). With regard to claims 2-7, Scifres et al. further indicates that more than two laser light beams can be provided to scan the recording medium in an overlapping manner with the number of beams corresponding to the required exposure intensity for the recording medium.

7. Claims 66, 68, 73-75, 105-107 are rejected under 35 U.S.C. 102(b) as being anticipated by Kurusu et al. (U.S. 5,012,089).

Kurusu et al. discloses a scanning beam control system for an optical scanning apparatus, which comprises a first beam (recording beam 25), a modulator (AOM 24) that receives said first beam at an optical input thereof, and produces a modulated light beam at an exit thereof, based on a modulation signal (image information provided by

image processor 300 and timing signal controlled by the servo unit 36), a second beam (reference beam 26), a scanner (polygon mirror 28) that receives the first and second beams and scans the first beam across the surface (600) and the second beam along a path substantially parallel to the path of the first beam, and a controller (servo unit 36) that provides said modulation signal responsive to the position of the second beam, wherein the first and second beams have substantially the same wavelengths (the main laser beam 22 emitted by the laser light source 21 being split into a recording beam 25 and a reference beam 26). Kurusu et al. further discloses a marked scale (31a or 31b, Figs. 12A or 12B) upon which the second beam (26) impinges, such that the second beam is reflected therefrom to form a modulated reflected beam (toward the photoelectric converter 62).

Kurusu et al. further teaches the scanner comprising a scan device (polygon mirror 28) that receives a beam along a first axis and periodically rotates the beam axis to form a rotating beam, and an optical system (f - θ lens 29) that translates the periodic rotation into periodic linear scanning of the beam, wherein the first and second beams are both scanned utilizing the scan device and the optical system (Fig. 1A).

8. Claim 67 is rejected under 35 U.S.C. 102(b) as being anticipated by Ohnishi et al. (U.S. 4,212,018).

Ohnishi et al. discloses a laser beam recording system comprising a first beam (recording beam 2), a modulator (3) that receives said first beam at an optical input thereof, and produces a modulated light beam at an exit thereof, based on a modulation

signal (image information provided by information source 4 and timing signal controlled by the driver 7), a second beam (read-out light beam 11), a scanner (polygon mirror 9) that receives the first and second beams and scans the first beam across the surface (18) and the second beam along a path substantially parallel to the path of the first beam, and a controller (driver 7) that provides said modulation signal responsive to the position of the second beam, wherein the first beam (argon ion laser source 1 emitting blue and green laser beam 2) includes energy at a wavelength different from the wavelength of the second beam (helium neon laser source 10 emitting a read laser beam 11).

9. Claims 84-85 are rejected under 35 U.S.C. 102(b) as being anticipated by Berman (U.S. 5,247,174).

Berman discloses a laser scanning apparatus having a modulated scanning beam (20a modulated by AOM 24), and a reference beam (20b), a scanner including a scan device (polygon mirror 36) for receiving the modulated beam and scanning the beam across a surface, an optical system (f- θ lens 38) that provides non-linear tracking of linear beam position and angle, to compensate for variations of power in the beam as a function of angle (col. 4, lines 35-45).

Berman further teaches a modulator (AOM 24) that receives a light beam at an optical input thereof, and produces the modulated light beam at an exit thereof, based on a modulation signal thereto, a second beam (20b), wherein the scanner (36) receives the modulated and second beams and scans the second beam along a path

substantially parallel to the path of the modulated beam, and a controller (beam position control 52) that provides said modulation signal responsive to the position of the second beam.

10. Claims 92-101 are rejected under 35 U.S.C. 102(b) as being anticipated by Kramer (U.S. 4,826,268).

Kramer discloses a laser scanning apparatus in which the position and intensity of the optical beam is controlled by changing the frequency and the amplitude of the drive signal to the acousto-optic modulator (82) to compensate for the cross-scan errors due to difference in the periodicity of the deflector (44), which enables each successive scan line on the image plane to be at uniform spacing (col. 4, lines 20-47).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 69-72, 76-80, 83, 108-110 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurusu et al. in view of Muto et al. (U.S. 5,371,608).

Kurusu et al. discloses all the basic limitations of the claimed invention except for the second beam impinging the scale at an angle to its surface, such that the modulated reflected beam is reflected along an axis, different from that of the second beam.

Muto et al. discloses an optical scan apparatus including a first laser light source (1) for generating a beam for scan optically modulated based on an image signal, and a second laser light source (7) for generating a beam for jitter amount detection, a rotating polygon mirror (4) whose facet 4a simultaneously scan the first and second beams, a marked scale (reflection type grating 10) onto which the second laser beam impinges at an angle (Fig. 2) and is reflected toward the facet 4b adjacent to facet 4a of the polygon mirror along an axis different from that of the incident second beam (col. 5, lines 15-32).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to position the marked scale of the device of Kurusu et al. such that the reflected second light beam takes a different path from the incident second beam as taught by Muto et al. The motivation for doing so would have been to allow the pulse light signal reflected from the marked scale to be obtained entirely.

13. Claims 86-88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berman in view of Muto et al.

Berman discloses all the basic limitations of the claimed invention including a beam position detector (50) formed by a grating scale, but fails to teach a reflection type grating as well as the reflected modulated second laser beam being returned in a different path as that of the incident second beam.

Muto et al. discloses an optical scan apparatus including a first laser light source (1) for generating a beam for scan optically modulated based on an image signal, and a second laser light source (7) for generating a beam for jitter amount detection, a rotating

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polygon mirror (4) whose facet 4a simultaneously scan the first and second beams, a marked scale (reflection type grating 10) onto which the second laser beam impinges at an angle (Fig. 2) and is reflected toward the facet 4b adjacent to facet 4a of the polygon mirror along an axis different from that of the incident second beam (col. 5, lines 15-32).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to position the marked scale of reflection type in the device of Berman such that the reflected second light beam takes a different path from the incident second beam as taught by Muto et al. The motivation for doing so would have been to allow the pulse light signal reflected from the marked scale to be obtained entirely.

Allowable Subject Matter

14. Claim 102 is allowed.

15. Claims 8-38, 81-82 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the primary reason for the indication of the allowability of the claimed invention is the inclusion of the limitation "wherein the beam is formed by separately modulating individual segments of an oblong beam, said segments comprising said sub-beams", in the combination as currently claimed in claims 8-10, the inclusion of the limitation "the unmodulated energy of at least two of the separately addressable sub-beams is

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different", in the combination as currently claimed in claims 11-13, the inclusion of the limitation "wherein a pattern having a minimum feature size is written and wherein the spacing of the sub-beams is substantially smaller than the feature size", in the combination as currently claimed in claims 14-18, the inclusion of the limitation "wherein the sub-beams are spaced by a predetermined distance at said surface and wherein the sub-beams have an extent at the surface in the direction of adjacent beams and wherein the extent is greater than the spacing", in the combination as currently claimed in claims 19-29, the inclusion of the limitation "exposing the surface utilizing the determined combination of parameters", in the combination as currently claimed in claims 30-31, the inclusion of the limitation "selectively varying the energy delivered to exposed areas on the [surface] by a ratio substantially greater than the scanning velocity ratio", in the combination as currently claimed in claims 32-38, the inclusion of the limitation "wherein the clock generator includes a first generator that generates an intermediate clock and an inverse intermediate clock having the same frequency and inverse phases, and switching circuitry having two inputs that receive the intermediate clock and the inverse intermediate clock respectively and a timing clock output to which the clock at one of the two inputs is selectively switched, such that the average frequency of the timing clock at the output is controlled by said selective switching", in the combination as currently claimed in claims 81-82, the inclusion of the limitation "wherein the overlap and the scanning velocity are separately controllable, such that a range of power levels greater than that possible with either the range of overlaps or than

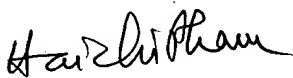
the range of velocities may be delivered to the surface", in the combination as currently claimed in claim 102.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (703) 308-1281. The examiner can normally be reached on T-F (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin R. Fuller can be reached on (703) 308-0079. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722, (703) 308-7724, (703) 308-7382, (703) 305-3431, (703) 305-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



**HAI PHAM
PRIMARY EXAMINER**

October 22, 2003